REMARKS

This Amendment, submitted in response to the Office Action dated March 14, 2006, is believed to be fully responsive to each point of rejection raised therein. Accordingly, favorable reconsideration on the merits is respectfully requested.

Claims 1-18 and 30-47 are pending in the present application. Claims 19-26 have been withdrawn from consideration.

I. Claim Rejections under 35 U.S.C. § 101

Claims 1-18 and 30-47 have been rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. The Examiner asserts that claims 1, 16-18, 34 and 44 do not provide a practical application that produces a useful, tangible and concrete result.

The Examiner appears to be applying an inappropriate standard as the "useful, tangible and concrete result" test is often applied with respect to mathematical algorithms or computer related inventions (see MPEP 2106) and not to the compression and extension of a color reproducing space as claimed.

Regardless, claim 1, for example, recites "A method of compressing/extending a color reproducing space for transforming a color reproducing space of a first image input/output device into a color reproducing space of a second image input/output device…a lightness correcting step for correcting lightness of the color gamut compressed or extended by the chroma compressing/extending step…" Contrary to the Examiner's assertion, a color reproducing space which is compressed or extended is obtained and the lightness of a color gamut is corrected. Consequently, a useful, tangible and concrete result is obtained.

Claim 16 recites "A method of compressing/extending a color reproducing space, comprising…correcting an edge shape of a color gamut of said second image input/output device in accordance with an edge shape of a color gamut of said first image input/output device…" Therefore, a color reproducing space which is compressed or extended is obtained and an edge shape of a color gamut is corrected.

Claim 17 recites "A method of compressing/extending a color reproducing space comprising …correcting a non-linear portion of an edge shape of a color gamut of said first image input/output device or said second image input/output device in a linear manner…" Consequently, a color gamut having a corrected edge shape is obtained.

Claim 18 recites "A method of compressing/extending a color reproducing space, comprising …adjusting at least one of corresponding a hue, the chroma range and the lightness region of the color reproducing space to transform into by compression or extension…" Consequently, a color reproducing spaced having an adjusted hue, chroma range or lightness region is obtained.

Claim 34 recites "A method of compressing/extending a color reproducing space for transforming a color reproducing space of a first image input/output device into a color reproducing space of a second image input/output device... a lightness correcting step for correcting lightness of the color gamut compressed or extended by a chroma compressing/extending step.." Consequently, a color gamut having a corrected lightness is obtained.

Claim 44 recites "A method of compressing/extending a color reproducing space for transforming a color reproducing space of a first image input/output device into a color

reproducing space of a second image input/output device…a lightness correcting step for correcting lightness of the color gamut compressed or extended by the chroma compressing/extending step…" Consequently, a color gamut having a corrected lightness is obtained.

Claims 1, 16-18, 34 and 44 clearly recite compressing/extending a color reproducing space for transforming a color reproducing space of a first image input/output device into a color reproducing space of a second image input/output device.

It is clear from the recitations in the present specification that the compressed/extended color reproducing space is used for the color transformation between the two image input/output devices, and it is recited in the present specification that the color transformation using compressed/extended color reproducing space can make the color reproduction more preferable. Therefore, it is clear that the transformation of the image signal of the present invention recited in the present independent claims 1, 16-18, 34 and 44, is not just a mathematical algorithm or a signal transformation processing of a computer, thus, the Examiner's rejection is clearly improper.

For at least the above reasons, Applicant submits that claims 1-18 and 30-47 contain statutory subject matter, therefore the 35 U.S.C. § 101 rejection of claims 1-18 and 30-47 should be withdrawn.

Further, Applicant submits that claims 1-15, 33, 34, 37-45 and 47 have not been rejected in view of prior art. Consequently, claims 1-15, 33, 34, 37-45 and 47 should be allowed.

II. Rejection of claims 16, 18, 30, 32, 35-36 and 46 under 35 U.S.C. § 103

Claims 16, 18, 30, 32, 35-36 and 46 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Ito et al. (U.S. Patent No. 6,301,383) in view of Lin et al. (U.S. Patent No. 6,204,939).

Claim 16

Claim 16 recites "correcting an edge shape of a color gamut of said second image input/output device in accordance with an edge shape of a color gamut of said first image input/output device." This is done prior to a transform between the first and second space. The Examiner asserts this is disclosed in Figs. 13-16, col. 1- col. 2, Figs. 4, 6 and 10 and col. 6- col. 8.

Figs. 13-16 merely illustrate a difference in the gamut of a monitor with that of a printer. In Fig. 14, the gamut of the printer 64 is narrower (different from) the gamut of the monitor 63. Therefore, in the figure, the colors in hatched ranges on the monitor 63 cannot be reproduced by the printer 64. See col. 2, lines 1-4. Color signals from the monitor are converted to signals within the gamut of the printer by performing color-gamut mapping. See col. 2, lines 5-9. The gamut mapping is performed in a color space which does not depend on a device and is normally performed in a CIE/L*C*h color space. See col. 2, lines 11-13. However, there is no indication that an edge shape of the color gamut of the printer (second image input/output device as cited by the Examiner) is corrected according to an edge shape of a color gamut of the monitor (first image input/output device). Moreover, there is no suggestion that such correction occurs prior to color reproducing space expansion or compression as claimed. The mappings shown by Figs.

15-16 correspond to compression in conjunction with mapping between color spaces and thus does not illustrate correction before compression.

Fig. 4 illustrates increasing the amount of data by interpolation. If the number of correspondences between signals CMY and signals L*a*b is not sufficient, the number of data is increased by interpolating the correspondence at a predetermined point from surrounding data point to form a new data point. See col. 5, lines 25-30. There is no indication that an edge shape of the printer gamut is corrected according to an edge shape of a monitor gamut. More particularly because Fig. 4 is used to illustrate the making of a forward-direction table which does not specifically pertain to a monitor or a printer. The discussion refers to sparseness in the table population which need not conform to an edge shape. Fig. 6 illustrates the generation of a look-up table and does not describe edge correction. Fig. 10 illustrates the correspondences of compression coefficient and does not illustrate an event occurring before compression.

Claim 16 further recites "wherein a **central color reproducing space** where said first image input/output device and said second image input/output device **overlap** and a peripheral color reproducing space where said first image input/output device and said second image input/output device **do not overlap, are both compressed or extended**." The Examiner concedes that Ito does not teach this aspect of the claim and cites Lin, col. 10, lines 30-67 to col. 11, lines 1-10 and 12-44, to cure the deficiency.

Lin discloses color matching of the original color images and reproduction of those images. The aspect of Lin cited by the Examiner, col. 10, line 30-col. 11, line 10, discloses that in the transformation from the first color space to a second color space, when the LUT for the transformation of the lattice point (color) of the first color space and the lattice point (color) of

the second color space is used to obtain the point (color) in the second color space corresponding to the point (color) in the first color space, i.e. in the in-gamut color mapping, if the point in the first color space is not on the lattice point, the coordinates of a given point in the first color space can be expressed, i.e. interpolated by the coordinates of the four lattice points surrounding it, and its coefficient, i.e. interpolation coefficient should be obtained to obtain a point in the second color space corresponding to the point in the first color space by using the four coordinates in the second color space corresponding to the four lattice points surrounding the given point in the first color space, and the interpolation coefficient. This in-gamut color mapping merely discloses that an interpolation method is used to obtain the relationship of two points corresponding to the two color spaces with a predetermined gamut(color reproducing spaces).

Also, col. 11, lines 12-44 of Lin merely discloses mapping out-of-gamut colors onto the boundary of the gamut by projecting the point (color) onto the line in color space representing neutral (gray) colors and clipping the projection at the gamut boundary, that is, the mapping of the out-of-gamut points (colors) to the gamut boundary.

Assuming *arguendo*, Lin discloses that the first color space itself and the second color space itself are predetermined and also discloses the method of obtaining the image (mapping) of the points (colors) between these predetermined first and second color spaces, Lin does not correct the first color space itself or the second color space itself by, for example, changing the shape and size of the color reproduction space, i.e. compressing or extending the color space itself.

In contrast, the exemplary embodiment of the present invention as recited in claims 16, 17 and 18 corrects, i.e. compresses/expands, the color reproducing space itself of the first color

reproducing space or the second color reproducing space when transforming from the color reproducing space of the first image input/output device to the color reproducing space of the second image input/output device. Specifically, the exemplary embodiment of the present invention corrects an edge shape of a color gamut of the second color reproduction space, corrects a non-linear portion of an edge shape of a color gamut of the first color reproducing space or the second color reproducing space in a linear manner, and adjusts a hue, the chroma range and the lightness region for the purpose of adjusting the color reproducing space. Therefore, in the present invention, the color reproducing space itself is adjusted and the color reproducing space itself is compressed or extended.

Lin does not disclose adjusting the color reproducing space itself, nor does Lin teach or suggest compressing or extending a color reproducing space.

Assuming *arguendo*, Lin discloses this aspect of the claim, the combination of Lin with Ito is not obvious. Ito is directed to mapping color signals of an input system **outside** the gamut obtained by the output system. See Field of the Invention, col. 3, lines 10-15, lines 23-27. Ito is not at all concerned with compressing or extending a color reproducing space where an input device and an output device overlap. Consequently, modifying Ito to include the teachings of Lin would result in a substantial modification of the principle of operation of Ito, evidencing that the Examiner's reasoning is merely a result of impermissible hindsight.

For at least the above reasons, claim 16 and its dependent claims should be deemed allowable. To the extent claim 18 recites similar elements, claim 18 and its dependent claims should also be deemed allowable.

Claims 35 and 36

Claims 35 and 36 describe correction of an edge shape of the color gamut of the second image input/output device. The Examiner asserts that this aspect of the claim is disclosed in Fig. 7, col. 2, lines 44- col. 3, lines 36 and col. 5, line 51 to col. 6, lines 65. Fig. 7 discloses a flowchart for gamut mapping. At no point is there a discussion of correcting an edge shape of the printer gamut. At most it would appear that some kind of correction is performed with respect to the monitor gamut in order to minimize a gamut formula. See col. 3, lines 10-15. For at least the above reasons, claims 35 and 36 should be deemed patentable.

III. Rejection of claims 17, 31 and 33 under 35 U.S.C. § 103

Claims 17, 31 and 33 have been rejected under 35 U.S.C. § 102(b)[1] as being anticipated by Hoshino (U.S. Patent No. 5,317,426) in view of Lin et al.

Claim 17

Claim 17 recites that before a color reproducing space is compressed or extended "correcting a non-linear portion of an edge shape of a color gamut of said first image input/output device (monitor as cited by the Examiner) or said second image input/output (printer) device in a linear manner."

As previously submitted, Hoshino does not teach or suggest this aspect of the claim. Hoshino, for example, in Figs. 13-19, illustrates color estimation used in order to perform extension of a gamut. The illustrations in Figs. 13-19 do **not** occur **before** a color reproducing

[1] It appears the Examiner meant to reject the claims under 35 U.S.C. § 103.

space is compressed or extended but occurs **while** a color reproducing space is extended. See col. 19, lines 35-40.

The Examiner concedes that Hoshino does not disclose "wherein a central color reproducing space where said first image input/output device and said second image input/output device overlap and a peripheral color reproducing space where said first image input/output device and said second image input/output device do not overlap, are both compressed or extended" and cites Lin to cure the deficiency.

Assuming *arguendo*, Lin was to be combined with Hoshino, Lin does not cure the deficiencies of Hoshino. In particular, Lin does not disclose correcting a non-linear portion of an edge shape of a color gamut before a color reproducing space is compressed or extended. Furthermore, Hoshino states that in the chroma direction, no value is corrected at the overlapped center portion between the color reproducing gamut of the input side and that of the output side. See col. 3, lines 54-57. Therefore, assuming *arguendo* Lin teaches the claimed elements, it would be contrary to Hoshino that both the central color reproducing space and the peripheral color reproducing space are both compressed or extended.

Lin merely discloses an interpolation used to obtain the coordinates of the corresponding points of the two color spaces. On the other hand, the interpolation of the present invention is an interpolation to obtain the amount of adjustment of the pretreatment to correct and adjust the color reproducing space itself. Therefore, Lin is clearly different from the exemplary embodiment of the present invention as claimed.

Accordingly, the interpolation disclosed in co1. 10, line 30-col. 11, line 10 of Lin does not teach the compression and extension recited in the present independent claims.

Thus, as Lin does not disclose compressing the central portion where the color reproducing space of the first and second image input/output devices overlap, Lin does not cure the deficiencies of Ito and Hoshino which disclose that neither the center of the color reproducing space where the first and second image input/output devices overlap nor the periphery of the color reproducing space where the first and second image input/output devices do not overlap is compressed.

Therefore, the present claims 16-18, 30-33, 35-36 and 46 cannot be rejected based on the combination of Ito, Hoshino or Lin, and the obviousness rejection of the Examiner is improper.

For at least the above reasons, claim 17 and its dependent claims should be deemed patentable.

IV. New Claims

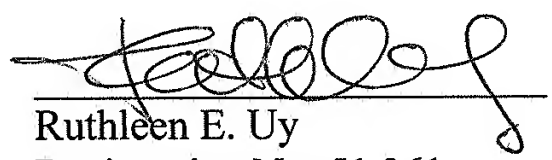
Applicant has added claims 48-52 to provide a more varied scope of protection. Claim 48-52 should be deemed allowable by virtue of their dependency to claims 16 and 17 for the reasons set forth above.

V. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Ruthleen E. Uy
Registration No. 51,361

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

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